Alan F. Ciamporcero
Executive Director

Federal Regulatory Relations
1275 Pennsylvania Avenue, N.W., Suite 400
Washington, D.C. 20004
(202) 383-6416

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October 12, 1994

EX PARTE

William F. Caton
Acting Secretary
Federal Communications Commission
Mail Stop 1170
1919 M Street, N.W., Room 222
Washington, D.C. 20554

Dear Mr. Caton:

Re: *PP Docket No. 93-253, Implementation of Section 309(j) of the Communications Act - Competitive Bidding*

In the following letter, Dr. Milgrom of Stanford on behalf of Pacific Bell answered questions from Dr. Evan Kwerel concerning the above referenced-proceeding. Please associate this material with this proceeding.

We are submitting two copies of this notice in accordance with Section 1.1206(a)(1) of the Commission's Rules.

Please stamp and return the provided copy to confirm your receipt. Please contact me should you have any questions or require additional information concerning this matter.

Sincerely,

Alan F. Ciamporcero

Attachment

cc: Evan Kwerel

STANFORD UNIVERSITY, STANFORD, CALIFORNIA 94305-6072

PAUL MILGROM
SHIRLEY AND LEONARD ELY, JR. PROFESSOR
OF HUMANITIES AND SCIENCES
DEPARTMENT OF ECONOMICS

TEL: (415)
FAX: (415) 725-
EMAIL: MILGROM@LE.STANFORD.EDU

October 11, 1994

Dr. Evan Kwerel
Federal Communications Commission
1919 M Street, NW
Washington, D.C. 20054

Re: Duration Control for Auction #4

Dear Evan:

At the Telecommunications Policy Research Conference, you expressed interest in my thoughts about how the FCC should exercise its discretion over stage transitions, bid increments, and round length during auction #4. It is, of course, impossible to forecast all the particular circumstances that might arise during the auction, but it is possible to develop default scenarios to help analyze the effects of particular policies and, on that basis, to determine what the default policy should be. The principal objects of the policy should be to allow bidders ample opportunity to evaluate and respond to significant developments during the course of the auction while still ensuring that the auction is completed in a reasonable length of time.

Reduced bid increments cannot, of course, be used to speed the auction along, but only to wring out the last dollars at the end and to help improve the efficiency of the auction outcome. Early use of reduced bid increments could lengthen the auction, but I have not analyzed those effects in detail. My analysis here focuses primarily on the early rounds of the auction, during which minimum increments of five percent are expected to be the norm.

For my recommendations, I assume that the FCC has a tentative target of about 8 weeks for the auction duration, with longer times acceptable if the total revenues significantly exceed the roughly $10/POP (roughly $5 billion) that was anticipated in federal budget estimates. I do not endorse this $10 figure, but use it partly because, as I understand it, this is still the "official" estimate and partly to avoid tipping my hand about my own and Pacific Bell's estimates. The basis for the eight weeks figure is nothing more than the informal discussions we had when I first presented the Milgrom-Wilson proposal in an *ex parte* meeting last year. The following analysis suggests that eight weeks could be a quite reasonable target if the budget estimates turn out to be in the right ballpark.

Length and Frequency of Rounds

The first question is: how long should bidding rounds be? The maximum reasonable frequency of bidding rounds is best thought about in terms of the information processing demands the auction imposes on the bidders. During the first few rounds, bidders may need to adjust and fine-tune their systems. It would be unwise to conduct more than one auction round per day until the bidders and the FCC have had a chance to eliminate the bugs from their systems in actual auction conditions. I suggest that you allow one full week for that.

Serious bidders will plan their strategy before the auction begins. They will have decided, at a minimum, on their opening bids, tentative rules for bid increments to be applied to the first few bidding rounds, and guidelines about how to bid in later rounds. They will have made their budgets and arranged financing to enable them to pay for the licenses they acquire. Once-a-day bidding rounds will not stress the decision support systems of a well-prepared bidder.

Twice-a-day rounds should also be manageable even for bidders interested in acquiring many licenses, provided there are at most one or two large jump bids to digest. Large jump bids are, of course, among the hardest contingencies to anticipate, so bidders will have to evaluate such bids in real time. Bidders also need more time to evaluate the subtle information conveyed by such bids than they need for more predictable bids near the minimum bid increment. Evaluating jump bids will be most difficult early in the auction when there are many active bidders, because there are then more scenarios to evaluate. To the extent that one can rely on the national narrowband auction experience, large jump bids are also most likely early in the auction when bidding activity is most intense. Large jump bids late in the auction will be rare, because bidders will want to avoid the risk of having to pay millions more than would otherwise be necessary to acquire a license.

In that light, it seems desirable to limit bidding rounds to one per day early in the auction when activity is high. Of course, the stage 1 activity rule would apply then. But how will the auction proceed under these operating rules? In particular, is an auction begun this way likely to finish within 8 weeks?

Guessing the Length of the Auction

For purposes of guessing the length of the auction, I make several simplifications and assumptions. First, I analyze the auction as a single aggregate entity, even though the prices of the individual licenses will actually rise at different rates. Also, on the basis of the FCC's statements about minimum bids and federal budget estimates concerning values, I assume that the opening bids will average about $3.00/POP and that all the most valuable licenses will draw at least one bid. The result would be first round high bids totalling about $1.4 billion. In the early rounds, if half of the licenses (in terms of value) draw new bids and if the highest bid increments are about 5.5%, then total revenues would rise at a rate of about $200 million per round. There can be no guarantees about these figures but, after investigating several alternative scenarios, these do seem to me to be conservative estimates of the rate of price increase in the early rounds. As such, they form a useful basis for setting default plans. Of course, there must also be contingency plans in case this default scenario is far off the mark.

In the default scenario, total prices would reach about $2.5 billion by the end of the first week and would continue to rise at a rate of about $1.0 billion per week for as long as bidding competition remains intense. Using the $10/POP estimate implicit in the federal budget, this pace could go on for only four weeks or so. If a slowdown in bidding then leads the FCC to adopt twice-a-day bidding and to switch to stage 2, then the auction could be brought to a close within 30 additional rounds (three weeks), even with minimum bid increments somewhat below five percent. That would allow the auction to come to completion within the eight-week scenario in the default case. Of course, the FCC's policy about minimum bid increments would affect the required number of rounds in the closing phase of the auction.

Default Policies to Control the Pace of the Auction

While it is most likely that prices will increase in the first few rounds at a rate of $200 million per day or more, at some point the rate of price increase will slow. This will occur as the high prices lead some bidders drop out or to scale back their plans and as other bidders hold back, intending to increase their levels of bidding activity at later rounds if circumstances are favorable. When prices begin to rise less than about $150 million per day, the FCC's default plan should be to increase bidding rounds to two per day. At the reduced level of activity, large jump bids will be less frequent and there will be fewer new bids to evaluate, so the more frequent bidding will not strain the bidders' information systems. This change will restore a rapid daily rate of revenue increase and promote an early conclusion of the auction. I emphasize that this suggestion about when to switch to two-a-day rounds is merely a guideline for the default scenario and is based on a highly aggregated measure — total revenue. In the actual auction, the administrators may need to consider a more detailed picture of auction activity in making this decision.

When should stage 2 be implemented? Moving to stage 2 is a powerful way both to move the auction toward its conclusion and to resolve bidder uncertainty about the competition. It does the latter because it flushes out any bidders who are "lying in the grass," waiting until later rounds to begin bidding more aggressively. Implementing stage 2, however, comes at the cost of restricting bidders' options. The Milgrom-Wilson proposal, which called for applying the stage 2 rule only after there have been five rounds of little bidding activity, still seems reasonable to me as a guideline for when to implement the stage change, with these caveats: The FCC should be reluctant to exercise its discretion to implement stage 2 during the first 30-40 rounds of the auction, because a declining level of activity during those early rounds may be simply a sign that the activity rule has not been needed to generate sufficient bidding and that the auction is proceeding toward a natural, early close. After about 60 rounds, the FCC should be prepared to switch to stage 2 if bidding has significantly slowed, even if the suggested conditions for triggering stage 2 have not been satisfied, because stage 2 activity rules will help to bring the auction to a smooth and timely close.

Closing Out the Auction

The stage 3 rules are very constraining on the bidders and were included in the Milgrom-Wilson proposal to guard against the possibility that bids might trickle in on just a few relatively low-valued licenses near the end of the auction, extending the auction unnecessarily for all bidders. However, stage 3 was suggested when we imagined that there might be a full simultaneous design involving both MTA and BTA licenses, with numerous substitution possibilities among licenses. In the actual circumstances of auction #4, the need for stage 3 rules is reduced.

The present rules allow two alternatives to stage 3 for speeding the close of the auction. The first is to call for a final round of bids; the second is to call for more frequent rounds. As the FCC and most commentators now agree, the first option is especially likely to undermine the FCC's auction objectives. I have explained the reasons in previous filings and won't repeat them here. The second option, however — that of more frequent rounds — could prove to be useful depending on the circumstances. If bids are crawling upwards on just a few licenses while other licenses attract no new bids, then the FCC might announce that rounds will be conducted more frequently. The default rule used by the auction administrator might to call for rounds to be conducted every two hours when recent bidding has focused on just a few licenses and there is no significant jump bidding. For example, once stage 2 has begun, the rule might specify bids every two hours if the set of active licenses (those that have received new bids in the previous five rounds) is six or fewer and if no bid increment in the most recent round exceeds 10% of the previous high bid.

Conducting rounds more frequently in this way is not a perfect substitute for stage 3, because it may allow bidders to strategically manipulate the pace of the auction, hoping to gain advantage. As one example, a bidder could delay the close of the auction by repeatedly raising its own bid on American Samoa by the minimum bid increment, thereby preventing the auction from closing. If the FCC were unwilling to implement stage 3, such a strategy might force it to call for a final round of bids. At that time, the bidder could leap from the grass, bidding on and perhaps winning a new license, with the current leading bidder having no chance to respond. The stage 3 activity rule would eliminate this strategy, since the American Samoa bidder would have no eligibility to bid on a new, higher valued license after stage 3 had been entered.

Further Considerations

The calculations in this letter are based primarily on a single default scenario. On the basis of the narrowband experience and the enormous range of revenue estimates by a variety of pundits for auction #4, it would be prudent for auction planners to admit the possibility that the estimate used here — or any other single estimate they may prefer — may be very far off the mark. If the revenues turn out to be lower than estimated, then the auction will finish faster than the previous analysis suggests. That timing appears to be quite acceptable. If it is common knowledge among the leading bidders that values are much higher than the initial estimates, then that would likely be reflected in higher bids during the first week of bidding by bidders seeking to establish their positions. If values are very high but that fact is not common knowledge among the leading bidders, then there will be intense bidding

competition early in the auction, leading revenues to climb at an estimated rate of 4-5% per round. With those estimates, total revenue would double with 14-18 extra rounds of intense competition, or quadruple with 28-36 extra rounds. During such intense bidding competition, frequent jump bidding is also a plausible possibility. That would lead prices to rise still more rapidly toward their final level.

Although a prompt ending to the auction would enhance perceptions of the auction's success, it is not the main goal. I hope and expect that those conducting the auction will recognize that allowing bidders adequate time to react to surprising developments during the auction is much more important than closing the auction in a short period of time.

In the analysis of this letter, I have assumed that the FCC will measure the progress of the auction primarily in terms of revenue. That is also how politicians and the press are likely to measure progress. From an analytical perspective, one could also measure auction activity in terms of the number of licenses receiving new bids or in terms of remaining eligibility of the bidders. These are useful aggregate indicators that the auction administrator and participants will want to track, along with more detailed information about the bidding activity in the individual MTAs. Because the remaining eligibility indicator is such a rough measure of bidding interest, however, it cannot be a suitable basis for a simple default rule. Total revenue, besides being the measure that the politicians and press will track, is also a pretty good measure of the total value being created. That leads me to recommend using changes in total revenue, rather than, say, the number of licenses attracting new bids, as the primary basis for default rules in auction #4.

I will look forward to seeing you the next time I'm in Washington.

Sincerely yours,

Paul Milgrom